

SPHAGNUM LEUCOBRYOIDES RECONSIDERED

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The peat mosses, of the class Sphagnopsida, are characterized by leaves made up of large, empty hyaline cells enclosed in a network of narrow, green cells. The hyaline cells are marked by pores on one or both surfaces and most commonly by delicate fibril thickenings. Globose, operculate capsules are produced terminally and elevated on an extension of the gametophytic axis, or pseudopodium, rather than a seta. The sporogenous tissue is derived from the amphithecium, which surrounds and overarches a domelike columella, and that point is most significant as all other bryophytes, except the hornworts, have an endothecial origin of sporogenous cells. The capsule wall is solid, and a very large number of pseudostomata occur over most of its surface.

The class consists of approximately 250 species of the genus *Sphagnum* in addition to a single species, recently described from Tasmania as *Sphagnum leucobryoides* Yam. et al. (1990). That species shows so many striking differences from *Sphagnum* in a traditional sense (Crum 1984), in both aspect and structure, that recognition of a new genus, *Ambuchanania*, in a new order and family seems essential. Owing to its many unique features, the species was segregated into the section *Buchanania* (Yamaguchi et al. 1990, 1992), but that name is not available at the generic level because of a previous homonym, and therefore the name *Ambuchanania* is chosen in honor of the original collector, A. M. Buchanan.

Ambuchananiales Seppelt & Crum, ordo nov.; **Ambuchananiaceae** Seppelt & Crum, fam. nov.; et **Ambuchanania** Seppelt & Crum, gen. nov.—TYPE: **Ambuchanania leucobryoides** (Yamaguchi, Seppelt, Iwatsuki & Buchanan) Seppelt & Crum, comb. nov. *Sphagnum leucobryoides* Yamaguchi, Seppelt, Iwatsuki & Buchanan, J. Bryol. 16: 45. 1990 [AUSTRALIA. Tasmania, A. M. Buchanan 9371 (holotype: HO!; isotype: HIRO!)].

Plantae parvae, parce ramosae, ramis solitariis vel bifasciculatis. Epidermis caulina e cellulis internis modice diversa. Folia oblongo-lanceolata, apice rotundata vel truncata, valde concava; cellulae hyalinae folii caulini parte bistratosae, rhomboideae, fere ad basin efibrillosae, eis basilaribus dorso paucis fibrillosis et prope apicem poris minutis non annulatis, usque ad 10 per cellulam; cellulae chlorophylliferae sectione transversali oblongae vel ovaes, superficiebus liberis incrassatis, eis foliorum rami triangularibus qua dorsalibus qua ventralibus expositis. Autoica; perichaetia terminalia; perigonia basi perichaetiorum. Capsula subglobosa; pseudopodia brevia.

The original description of *Sphagnum leucobryoides* provided a wealth of detail and many useful illustrations. It should suffice at this point to review the important features of the species, most of which differ significantly from *Sphagnum* in a restricted sense. The plants somewhat resemble a *Leucobryum* because of a whitish and notably glossy, dry aspect and also because of sparse branching. The branches are of two poorly differentiated types, most of them very short and single (or rarely paired) and others, perhaps representing secondary stems, somewhat longer. The stem has a barely differentiated cortex that lacks pores and fibrils, and there is no wood cylinder. The leaves are unusually large, those of the stem as much as 4.3 mm long and those at the ends of short branches up to 8.6 mm long. The leaves are bordered by many rows of long, narrow, thin-walled cells. The hyaline cells are in one or sometimes two layers. Exceedingly delicate fibrils occur in a few hyaline cells at the base of stem leaves, but they are better represented in scattered cells of median and basal portions of branch leaves. Small, unringed pores are scattered on the outer surface toward the leaf tips. The green cells of branch leaves occur at both dorsal and ventral surfaces. They are small, triangular, and thin-walled with exposure on the inner surface in the upper part of the leaf, but in the lower half they are larger, narrowly elliptic, and thick-walled with some of them exposed dorsally and some ventrally, and the walls of hyaline cells abutting them are spiculate-papillose. Terminal groups of archegonia are borne in the protection of enlarged perichaetial leaves, and naked groups of oblong-cylindric antheridia occur at the base of perichaetia. The capsules are produced singly in a terminal position, and there is no seta, the capsules being elevated on a short gametophytic pseudopodium. Sporogenous tissue overarches the columella (and is presumably amphithecial in origin, as in the genus *Sphagnum*).

Outstanding differences found in the genus *Sphagnum* are, as follows: stems with differentiated cortex and wood cylinder; fasciculate branches; leaves bordered by rather few rows of thick-walled cells; hyaline cells unistratose, with pores and fibrils throughout; archegonia produced on short branches near the stem tip and sporophytes not terminal; antheridia subglobose, at sides of leaves of well-formed branches situated in fascicles well below the perichaetia.

The species was originally found almost entirely buried in sand at a near-coastal locality of southwestern Tasmania in a sandy wash. The soil, derived from Precambrian quartzite, was extremely low in nutrients. Vegetation cover was sparse, consisting of *Leptocarpus tenax* (Restionaceae) and *Gaimardia amblyphylla* (Centrolepidaceae). The surrounding vegetation was a hummock sedgeland dominated by the tussock-forming *Gymnoschoenus sphaerocephalus*.

A second locality is now known from an inland site on the southwestern margin of the Tasmanian central plateau near Adelaide River (*Jean Jarman*, 1 Feb 1986, HO 34540) — more specifically in a locale near the Jane River southwest of Butler's Gorge. The plants grew on peaty soil in a *Gymnoschoenus*, or "button grass," moorland among the roots of *Isolepis aucklandica* (both in the Cyperaceae). Because of its modest appearance, almost identical to that of the original collection, the plants came to notice only because of the sharp eye of the collector of the type, A. M. Buchanan, who removed them from the roots of the *Isolepis*. It seems likely that a careful search will result in further collections in low-nutrient, acidic habitats.

LITERATURE CITED

- Crum, H. 1984. Sphagnopsida, Sphagnaceae. North America Flora, series II, part 11, iv + 180 pp. New York Botanical Garden.
- Yamaguchi, T., R. D. Seppelt, Z. Iwatsuki, and A. M. Buchanan. 1990. *Sphagnum* (sect. *Buchanania*) *leucobryoides* sect. et sp. nov. from Tasmania. J. Bryol. 16: 45-54.
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